

**WHAT IS CLAIMED IS:**

1. In a process for quenching a gaseous reaction mixture during the phosgenation of diamines in the gas phase to produce diisocyanates, in which the gaseous reaction mixture contains at least a diisocyanate, phosgene and hydrogen chloride, the improvement comprising injecting a quenching liquid into the gas mixture continuously flowing out of a cylindrical reaction zone into the downstream cylindrical quenching zone, with at least two spray nozzles arranged at the entrance to the quenching zone at equal distances along the circumference of the quenching zone.
2. The process according to Claim 1, wherein the spray nozzles independently are arranged such that the direction of flow of each quenching liquid is at an angle of about 0° to about 50° to the direction of flow of the gas mixture.
3. The process according to Claim 1, wherein the cone angle of the spray nozzles independently is about 20° to about 90°.
4. The process according to Claim 1, wherein the spray nozzles comprise a nozzle head with at least two individual nozzles.
5. The process according to Claim 1, wherein the quenching liquid is an organic solvent, a mixture of different organic solvents or a solution of the diisocyanate in an organic solvent.
6. The process according to Claim 1, wherein the temperature of the quenching liquid is about 100 to about 170°C.

7. The process according to Claim 1, wherein the quenching process comprises two or more steps.
8. The process according to Claim 7, wherein different quenching liquids are used in the quenching steps.
9. The process according to Claim 2, wherein the angle is about 20° to about 35°.
10. The process according to Claim 3, wherein the angle is about 30° to about 60°.
11. The process according to Claim 1, wherein the quenching liquid is selected from the group consisting of monochlorobenzene and o-dichlorobenzene.